

IN THE CLAIMS:

Please CANCEL claims 16-55 without prejudice to or disclaimer of the recited subject matter. All claims currently pending in this application are below for the Examiner's convenience.

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1. (Previously Presented) A projection exposure apparatus comprising:
a projection optical system arranged to project a pattern onto a substrate;
a holding portion arranged to hold an optical element which propagates light toward said projection optical system;
a mask having a transmission portion and being disposed on or near an image plane or object plane of said projection optical system or a plane conjugate to the image plane and the object plane;
an actuator arranged to drive said mask along a plane of an image of said optical element formed by said projection optical system; and
a measurement device arranged to measure an intensity of light while said mask is driven, the light emerging from said optical element, and passing through said projection optical system and the transmission portion of said mask, said measurement device including a measurement surface positioned at a plane conjugate to a pupil plane of said projection optical system or a plane spaced apart from said mask enough to separately detect respective rays emerging from plural points of the pupil plane and passing through the transmission portion.

2. (Original) The apparatus according to claim 1, further comprising an arithmetic device for calculating aberration of said projection optical system on the basis of a measurement result of said measurement device.

3. (Original) The apparatus according to claim 1, further comprising an arithmetic device for calculating ray aberration of said projection optical system on the basis of a measurement result of said measurement device.

4. (Original) The apparatus according to claim 1, further comprising an arithmetic device for calculating wavefront aberration of said projection optical system on the basis of a measurement result of said measurement device.

5. (Original) The apparatus according to claim 1, wherein
said optical element is arranged near the object plane of said projection optical system, and
said mask is arranged near the image plane of said projection optical system.

6. (Original) The apparatus according to claim 5, wherein
said optical element includes a mask having a transmission portion, and
light is emitted toward said projection optical system by illuminating said mask serving as said optical element by an illumination system.

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7. (Original) The apparatus according to claim 1, wherein
said optical element is arranged near the image plane of said projection optical
system, and
said mask is arranged near the object plane of said projection optical system.

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8. (Original) The apparatus according to claim 7, wherein
said optical element includes a mask having a transmission portion, and
light is emitted toward said projection optical system by illuminating said mask
serving as said optical element by an illumination system.

9. (Original) The apparatus according to claim 7, wherein
the projection exposure apparatus further comprises an illumination system,
said optical element includes a reflecting member, and
said reflecting member reflects, toward said projection optical system, light which
is emitted by said illumination system and is incident on said reflecting member via said
projection optical system.

10. (Original) The apparatus according to claim 9, further comprising a reflecting
mirror for deflecting light which emerges from said optical element and passes through said
projection optical system, and guiding the light to said mask.

11. (Original) The apparatus according to claim 1, wherein
said optical element is arranged near the object plane of said projection optical
system,
said mask is arranged near a plane conjugate to the object plane of said projection
optical system,
the projection exposure apparatus further comprises a first reflecting mirror
arranged on the image plane side of said projection optical system, and a second reflecting mirror
for reflecting, toward said measurement devices, light which is reflected by said first reflecting
mirror and passes through said projection optical system, and
light which emerges from said optical element passes through said projection
optical system, is reflected by said first reflecting mirror, passes through said projection optical
system again, is reflected by said second reflecting mirror, and guided to said mask.

12. (Original) The apparatus according to claim 1, wherein
said optical element and said mask are arranged near the object plane of said
projection optical system,
the projection exposure apparatus further comprises a reflecting mirror arranged
on the image plane side of said projection optical system, and
light which emerges from said optical element passes through said projection
optical system, is reflected by said reflecting mirror, passes through said projection optical
system again, and is guided to said mask.

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13. (Original) The apparatus according to claim 1, wherein
said optical element and said mask are arranged near the image plane of said
projection optical system,
the projection exposure apparatus further comprises a reflecting mirror arranged
on the object plane side of said projection optical system, and
light which emerges from said optical element passes through said projection
optical system, is reflected by said reflecting mirror, passes through said projection optical
system again, and is guided to said mask.

14. (Original) The apparatus according to claim 1, wherein a predetermined
region near the image plane or object plane of said projection optical system falls within an
isoplanatic region of said projection optical system.

15. (Original) The apparatus according to claim 1, wherein light which emerges
from a predetermined region near the image plane or object plane of said projection optical
system sufficiently covers a pupil of said projection optical system.

Claims 16-55 (cancelled).